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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,816	12/30/2003	Andreas Bibl	09991-150001	9369

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EXAMINER	
HSIEH, SHIH WEN	

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 11/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/749,816	BIBL ET AL.	
	Examiner	Art Unit	
	Shih-wen Hsieh	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19,21 and 23-31* is/are rejected.

7)☒ Claim(s) *20 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 May 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11-1-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Please fill in the blanks in pages 5, 7 and 8, such as the serial numbers and the filing dates, etc.

Claim Objections

2. Claims 22, 27 and 31 are objected to because of the following informalities:

In regard to:

Claim 22:

A word such as "providing" seems short between "and proximate each of the openings" and "a plurality of projections". Examiner thinks "and proximate each of the openings providing a plurality of projections" is appropriate.

Claim 27:

Please change "the projections" into "the posts" to match its antecedent "posts" recited in claim 25 to which this claim depends on.

Claim 31:

Line 3-4, please change "the plane" to "a plane" to correct a minor lack of antecedent basis problem.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation of "wherein the spacing between the projections and the perimeter of the nozzle opening is about 20% of the nozzle opening width or greater is unclear. Because there are a number of projections on the face of the nozzle plate as that were shown in figs. 1 and 2. Therefore, which spacing is meant by this claim is vague. As in specification page 5, lines 15-17, the spacing is presumed as the space that the outmost projections away from the waste channels (119 and 122), which are the perimeters of the nozzle plate. Please explain. Since the nature of this claim is unclear at this time, therefore, there is NO art rejection to this claim in this office action.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-6, 8, 12-16, 18, 21, 24 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Merkel et al. (US Pat. No. 5,604,521).

In regard to:

Claim 1:

Merkel et al. teach:

A drop ejector, comprising:

a flow path (14, fig. 1) in which fluid is pressurized to eject drops from a nozzle opening (22, fig. 1), and proximate the nozzle opening, a plurality of projections (28, fig. 1) extending transversely to the plane of the nozzle opening, refer to col. 4, line 48 to col. 5, line 7.

Claim 2:

Merkel et al. further teach:

wherein the nozzle opening (22) is surrounded by projections (28), refer to col. 5, lines 1-3 and fig. 1.

Claims 3 and 4:

Merkel et al. further teach:

wherein the projections are posts (claim 3); and

wherein the projections are wall-shaped (claim 4), refer to fig. 1, in fig. 1, the projections 28 are raised up, and can be seen as posts or wall-shaped.

Claim 5:

Merkel et al. further teach:

wherein the projections are arranged in a pattern, refer to fig. 1, where a straight pattern is shown.

Claim 6:

Merkel et al. further teach:

wherein the pattern defines an array of rows and columns, refer to fig. 1, since nozzles 22 are generally arranged in arrays, therefore the projections 28 associated with the nozzles 22 also arranged in arrays, and in a print head, more than one arrays are arranged, thus forms columns and rows.

Claim 8:

Merkel et al. further teach:

wherein the pattern defines concentric ink-collection spaces, refer to col. 5, lines 20-24 and col. 6, lines 30-34.

Claim 12:

Merkel et al. further teach:

wherein the number of the projections is four or greater, refer to fig. 1, where fig. 1 shows at least three projections.

Claim 13:

Merkel et al. further teach:

wherein the height of the projections is substantially equal to the plane of the nozzle opening, refer to fig. 1, where the heights of the projections 28 and the plane of the nozzle opening 22 (the back plane or plane 26 in fig. 2) are at the same level.

Claim 14:

Merkel et al. further teach:

wherein the height of the projections is below the plane of nozzle opening, refer to fig. 1, the plane of nozzle opening (22) is the front face (24). Therefore, with respect to this plane, the projections (28) is below plane (24).

Claim 15:

Merkel et al. further teach:

wherein the height of the projections is above the plane of the nozzle opening, refer to fig. 1, where the plane is (26, fig. 2), therefore, the projections (28) are above this plane (26).

Claim 16:

Merkel et al. further teach:

wherein the nozzle opening and projections are defined in a common body, refer to fig. 1, where the slant lines of the orifice plate (same as nozzle plate) member (20) indicates the nozzle opening and projections are defined in a unity member or in a common body.

Claim 18:

Merkel et al. further teach:

a channel (14, fig. 1) proximate the projections (28, fig. 1), refer to col. 5, lines 3-7. Note: ink receiving cavities (14) is the ink channels.

Claim 21:

Merkel et al. further teach:

wherein the nozzle opening is disposed on a platform (20) and the projections (28) are disposed proximate the platform.

Claim 24:

Merkel et al. further teach:

a piezoelectric actuator (12), refer to col. 4, lines 52-54.

Claim 25:

A drop ejector comprising:

a flow path in which fluid is pressurized for ejection through a nozzle opening, and proximate said nozzle opening, at least four posts extending transversely to the plane of said nozzle opening, said posts and said nozzle opening being defined in a common body.

Rejection:

The recitation of this claim is the combination of recitations of claims 1, 12 and 16 and is rejected on the basis as set forth for these claims discussed above.

7. Claim 28 is rejected under 35 U.S.C. 102(b) as being anticipated by Cloutier et al. (EP 0 110 534).

Cloutier et al. teach:

A method of fluid ejection, comprising:

providing a print head (a print head is the nozzle plate or orifice plate 27 shown in figs. 1 and 2) including a flow path (indicated by letter "D" and the arrow in fig. 1) in which fluid is pressurized (by the resistors 13 and 15, figs. 1 and 2) for ejection through

a nozzle opening (23 or 25, figs. 1, 2 and 6), and proximate the nozzle opening a plurality of projections (31, figs. 3 and 6, Cloutier et al. them the spacer) extending transversely to the plane of the nozzle opening, the projections defining a space transverse to the nozzle opening, refer to page 4, lines 27-31; page 5, lines 3-5; and page 6, lines 3-17,

providing a fluid that is wicked by capillary forces into the space defined by said projections, refer to page 6, lines 11-15 and page 7, lines 1-3, and

ejecting said fluid through said nozzle opening by pressurizing said fluid in said flow path, refer to page 4, lines 27-31. Please note: the bubble-driven ink jet printer in line 31 is the way to pressurize ink.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 7, 9, 11, 17, 23, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merkel et al.

In regard to:

Claim 7:

The device of Merkel et al. DIFFERS from claim 7 in that it does not teach:

wherein the pattern defines an arc.

An arc is simply an arrangement of nozzle arrays, generally in a round print head. However, no matter the print head is presented in a rectangular shape as that was shown in Merkel et al.'s invention or in a round shape, the functions of the print head are the same, refer to MPEP 2144.04 IV B.

Therefore it would have been an obvious matter that once the print head was fabricated in a round shape, the arrangement of the nozzle arrays on the nozzle plate of the head will likely to be arranged in an arc shape so as to fit the shape of the head.

Claim 9:

The device of Merkel et al. DIFFERS from claim 9 in that it does not teach:

wherein the projections have a width that is about twice the nozzle opening width or less.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to fabricate the size of the projections, since it has been held that discovering an optimum value of a result effective variable, such as the size of the projections, involves only routine skill in the art, refer to MPEP 2144.05 II B.

Claim 11:

The device of Merkel et al. DIFFERS from claim 11 in that it does not teach:

wherein the spacing between projections is about twice the nozzle width or less.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to fabricate the nozzles at a certain intervals or pitches, since it has been held that discovering an optimum value of a result effective variable, such as the size of the projections, involves only routine skill in the art, refer to MPEP 2144.05 II B.

Claim 17:

The device of Merkel et al. DIFFERS from claim 17 in that it does not teach:

wherein the body is a silicon material.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to select a known material as the material of the body, since it has been held to be within the general skill of a worker in the art to select a known material such as silicon on the basis of its suitability for the intended use, refer to MPEP 2144.07.

Claim 23:

The device of Merkel et al. DIFFERS from claim 23 in that it does not teach:

wherein the nozzle opening width is about 200 micron or less.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to design the nozzle opening width, since it has ben held that discovering an optimum value of a result variable, such as the width of the nozzle opening, involves only routine skill in the art, refer to MPEP 2144.05 II B.

Claim 26:

The drop ejector of claim 25 wherein the spacing between said posts is about 10% of the nozzle opening width or greater and twice the nozzle opening width or less.

Rejection:

The recitation of this claim is similar to that in claim 11 dealing with the spacing between posts with additional "10% of the nozzle opening width or greater" and is rejected on the basis as set forth for claim 11 discussed above.

Claim 27:

The drop ejector of claim 25 wherein the projections have a width that is about twice the nozzle opening or less.

Rejection:

The recitation of this claim is the same as that in claim 9 and is rejected on the basis as set forth for claim 9 discussed above.

10. Claims 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merkel et al in view of Otsuka et al. (US pat. No. 5,912,689).

The device of Merkel et al. DIFFERS from claim 19 in that it does not teach:

vacuum source or wicking material proximate the projections.

Merkel et al. teach a print head assembly (10) without further include an ink tank or an ink reservoir, which is a part of the ink jet print head assembly.

To this end, Otsuka et al. teaches in their fig. 5, an ink tank, which supplies ink to a print head through ink supply port (110), a sponge member (206) is disposed in the ink functioned as a negative pressure generating mechanism, refer to col. 6, lines 40-46. Since a print head (such as the one 601 shown in fig 1, the prior art) is connected with the ink tank shown in Otsuka et al.'s fig. 5, therefore, the negative pressure generated by the sponge will transmitted to the nozzles through the connections.

Therefore it would have been an obvious matter that an ink jet printer has an ink tank contained sponge for supplying negative pressure as that taught by Otsuka et al. is generally used in an ink jet printer such that the negative pressure will hold the ink in the nozzle in a form of meniscus without dripping during non-printing period.

11. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cloutier et al.

The device of Cloutier et al. DIFFERS from claims 29 and 30 in that it does not teach:

wherein the fluid has a surface tension of about 20-50 dynes/cm (claim 29); and

wherein the fluid has a viscosity of about 1 to 40 centipoise (claim 30).

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to select a type of fluid, which has characteristics

such as those recited in claims 29 and 30, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, refer to MPEP 2144.04 II A.

12. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Merkel et al. in view of Miyata (US Pat. No. 5,992,974).

A drop ejector, comprising:

a flow path in which fluid is pressurized to eject drops from a nozzle opening, and proximate the nozzle opening, a plurality of projections extending transversely to the plane of the nozzle opening, wherein the nozzle opening and projections are defined in a common body fabricated from a silicon material and wherein the nozzle opening is disposed on a platform and the projections are disposed proximate the platform.

Rejection:

This claim is a combination of claims 1, 16, 17 and 21 and is rejected on the basis as set forth for claims 1, 16 and 21 discussed above.

The device of Merkel et al. DIFFERS from claim 31 in that it does not teach:

the common body is silicon material.

Miyata teaches an ink-jet head and its manufacturing method, in which a nozzle plate (6, fig .1) having nozzle openings (7, fig. 1) is in a form of silicon, refer to col. 3, lines 41-53.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Merkel et el. to use silicon

material as taught by Miyata as the body material for the purpose of applying anisotropically etching to the nozzle plate so as to form nozzles shaped as that shown in fig. 1(b).

Allowable Subject Matter

13. Claims 20 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter:

In regard to:

Claim 20:

The primary reason for the allowance of claim 20 is the inclusion of the limitation of wherein the nozzle opening is disposed in a well and the well includes said projections. It is this limitation found in this claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

Claim 22:

The primary reason for the allowance of claim 22 is the inclusion of the limitation of a plurality of nozzle openings and proximate each of the nozzle openings a plurality

of projections, said nozzle openings and said projections defined in a common body. It is this limitation found in this claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-wen Hsieh whose telephone number is 571-272-2256. The examiner can normally be reached on 7:30AM -5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Talbott can be reached on 571-272-1934. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

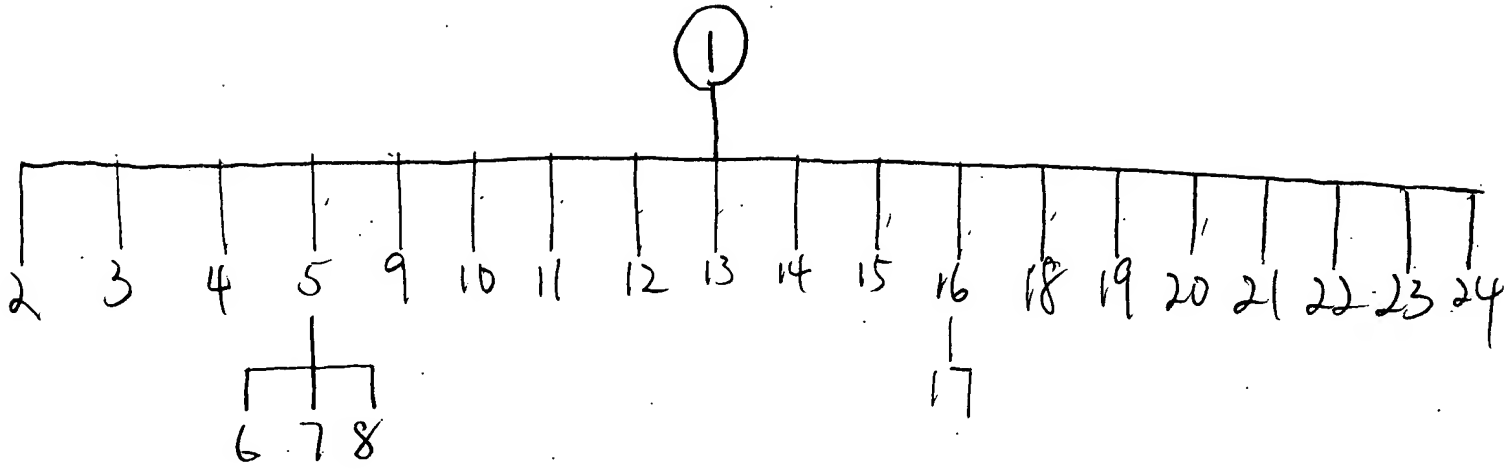
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SHIH-WEN HSIEH
PRIMARY EXAMINER

Shih-wen Hsieh
Primary Examiner
Art Unit 2861

SWH
Nov. 3, 2005

10/749,816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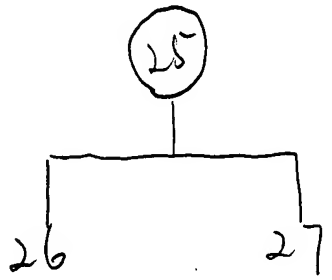
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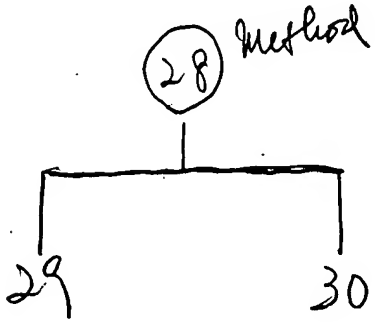
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